University College, Liverpool (now the University), and at Erlangen, and has been assistant professor at University College, Bristol, since 1903. He has published many papers in journals of chemical societies, both in England and Germany, among his most recent papers being one on benzoyl nitrate, which describes a new method for the nitration of organic compounds.

THE annual report of the South Australian School of Mines and Industries for 1905 shows that excellent progress in technical education is being made at Adelaide. The number of students enrolled was 1507, and the number of subjects taught was forty-five, courses having been started during the year in agriculture, building drawing, dairy work, motor management, veterinary science, and flower culture. The report contains a detailed account of the laying of the foundation-stone of the new metallurgical building on October 3, 1905.

FROM among recently made foreign appointments we note the following:—Dr. Emil Bose, lecturer in physics of Göttingen University, to be professor of physical chemistry in the Danzig Technical High School; Dr. Alfred Kalähne, of Heidelberg University, to the physics chair of the same institution; Dr. Taddäus Godlewski to be extraordinary professor of general and technical physics in the Technical High School, Lemberg; Dr. K. Fries to be a departmental director of the chemical institute of Marburg University in succession to Prof. R. Schenck, who has received an appointment in Aachen; Dr. Franz Waterstradt, scientific assistant to the German Agricultural Society, to be extraordinary professor in the University of Breslau; the lecture courses on inorganic and analytical chemistry of the Faculté des Sciences of Paris University, which Prof. Ribau is giving up on his retirement from active academic life, have been deputed to MM. Paul Lebeau and G. Urbain, while M. L. Ouvrard has been appointed director des laboratoire d'enseignement et de recherches chimiques of the same faculty.

THE new laboratory of physical and electrochemistry which has been presented to the University of Liverpool by Mr. E. K. Muspratt will be formally opened on Saturday, October 13, by Sir William Ramsay, K.C.B., F.R.S. Besides many eminent English chemists, the following distinguished foreign men of science have accepted invitations to be present:—Profs. Ostwald (Leipzig), Abegg (Breslau), Cohen (Utrecht), Goldschmidt (Christiania); also Prof. Lash Miller (Toronto). Addresses will be delivered by Sir William Ramsay and Prof. Ostwald. The distinguished guests will be entertained to dinner by the University Association on October 12, and by the Liverpool section of the Society of Chemical Industry on October 13. The new laboratory contains twenty-one rooms, and has been specially built and fitted for work in physical and electrochemistry. Its electrical equipment includes an 80-kilowatt motor alternator, a 30-kilowatt motor generator for direct current, a 10-kilowatt charging set (all by Messrs. Siemens Bros.), and a 36-cell Tudor accumulator battery. The name of the new laboratory is to be "The Muspratt Laboratory of Physical and Electrochemistry."

ON Wednesday, October 3, Sir William Ramsay, K.C.B., will give a public lecture at University College, London, on "The Chemical Nature of Electricity," and on October 4 Prof. L. W. Lyde will give an introductory lecture on "Geography as a 'Corollating' Subject in School Work." These two lectures are open to the public without payment or ticket. Among the courses of free lectures shortly to be commenced at the college are the following:—Six lectures, open to the public without payment or ticket, on the "History of Statistics and the Nature and Aims of Modern Statistical Methods," by Mr. G. U. Yule, on Wednesdays at 5.30, commencing Wednesday, October 10; ten lectures on "Recent Development in the Teaching of Arithmetic and Elementary Mathematics," by Mr. F. L. Grant, on Saturday mornings at 10 a.m., beginning on Saturday, October 13; ten lectures on "The Hygienic Needs of the Scholar," by Prof. Henry Kenwood, on Thursday evenings at 7.30 p.m., beginning on Thursday, October 11. This course and that on mathematics are open, without fee, to all teachers in London schools. Teachers wishing to attend should apply for forms to the Executive Officer, London County Council Education Offices, Victoria Embankment, W.C. Forms must be returned not later than Saturday, September 22.

SPEAKING at Hawarden on Monday on the objects and advantages of education, Mr. Wyndham remarked that "it was right to include science in the curriculum because we are now living in an age of science. In the sixteenth century people lived in an age of literature, and the minds of men were attracted toward the old books written in Greek and Latin." This difference between the needs of the two ages was pointed out by Sir Norman Lockyer in an address at the Borough Polytechnic Institute last December, printed in NATURE of March 29 (vol. lxxiii., p. 521), as the following extract from the address clearly shows:—"We must arrange our education in some way in relation to the crying needs of the time. The least little dip into the history of the old universities will prick the bubble of classical education as it is presented to us to-day. Latin was not learned because it had the most magnificent grammar of known languages. Greek was not learned in consequence of the transcendental sublimity of ancient Greek civilisation. Both these things were learned because people had to learn them to get their daily bread, either as theologians or doctors or lawyers, and while they learned them the 'nature of things' was not forgotten. Now what is the problem of to-day? We are in a world which has been entirely changed by the advent of modern science, modern nations, and modern industries, and it is therefore perfectly obvious that if we wish to do the best for our education it must be in some relation to those three great changes which have come on the world since the old days."

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 31.—"On the Main Source of 'Precipitable' Substance and on the *Rôle* of the Homologous Proteid in Precipitin Reactions." By Prof. D. A. **Welsh** and Dr. H. G. **Chapman**. Communicated by Dr. C. J. Martin, F.R.S.

Conclusions.—(1) The homologous proteid is not wholly removed from the superfluid of a precipitin interaction, whether it is more than sufficient or less than sufficient to neutralise all the precipitin present.

(2) Conclusive evidence that the homologous proteid is sensibly diminished in similar circumstances has not been obtained.

(3) The substance that is thrown out of solution is derived mainly from the anti-serum.

(4) The character of an anti-serum depends upon two factors which are mutually independent, (*a*) the precipitable content, (*b*) its precipitability.

(5) The precipitable content is indicated by the maximum precipitum obtainable from a given amount of the anti-serum.

(6) Its precipitability is indicated by the minimum amount of homologous proteid that will completely neutralise the precipitin in a given amount of the anti-serum.

(7) The solid content of precipitin anti-sera is increased relatively to that of natural sera.

June 28.—"On the 'Kew' Scale of Temperature and its Relation to the International Hydrogen Scale." By Dr. J. A. **Harker**.

In 1887 the International Committee of Weights and Measures adopted as the standard thermometric scale the *constant-volume hydrogen thermometer*. By far the majority of temperature measurements are made by means of mercury thermometers. The ideal mercury thermometer would be one which, when subjected to any steady temperature, would assume immediately a steady reading identical with that given by the hydrogen thermometer at the same temperature. This ideal is, as might be expected, not attained by any known mercury-in-glass thermometer, and the amount of the departure from the ideal at different

temperatures depends on the particular kind of glass employed.

For many years thermometers have been verified at Kew Observatory in large numbers annually, their indications being referred to the *Kew Scale* of temperature. It has recently become a matter of interest to determine to what degree of accuracy the *Kew Scale* may be considered as identical with that of the hydrogen thermometer, and this memoir gives an account of some experiments undertaken at the National Physical Laboratory with a view to elucidate this question.

The usual type of Kew standard thermometer is an instrument having a range from below 32° to above 212° F., and is usually divided only to 1° F.

For the purpose of this research it was thought desirable, after studying the behaviour of a number of these old thermometers, to construct new standards, having a more open scale and capable of being read to higher accuracy, and to treat these from the beginning in a definite and systematic manner.

The readings of a Kew standard are always understood to apply to the thermometer in a vertical position when immersed in water up to the reading, and the instruments are always intended to be used as "fixed" rather than as "movable zero" instruments. That is, the normal procedure to measure any temperature on the Kew scale would be *first* to determine the zero and *afterwards* the temperature in question, applying to the latter a constant correction for any deviation of the zero point from its nominal correct value, 0° C. or 32° F., and ignoring all subsequent zero changes.

The main conclusions of the work are:—

(1) The departure of the natural scale of the "Kew" mercury-in-glass thermometer from the international hydrogen scale is very small at all temperatures.

(2) For measurement of temperature *differences* over ordinary ranges, such as in calorimetry, the results obtained directly or indirectly from a Kew standard may be considered as hydrogen temperatures without application of any correction.

(3) In some instances when defining the temperature at which certain standards have their definite value, such as, for example, the temperature 62° F. for the British standard yard, the temperature scale to which the measurement referred was not definitely specified. This research renders it probable that if the instrument were a good English glass thermometer approximating to a Kew standard, the error made in considering its indications as identical with the hydrogen scale would be within the limits of accuracy of length measurements.

(4) For the ordinary ranges of meteorological and clinical thermometers reading to 0°·1 F., many thousands of which have been verified at Kew annually for many years past, the temperatures as given on the Kew certificate may be considered as hydrogen temperatures.

(5) The table appended gives the mean departure from the hydrogen scale of the "Kew" scale of temperature as

Differences in Degrees Centigrade.

	Kew glass. $T_{Kew} - T_{Hyd.}$	Verre dur. $T_{VD} - T_{Hyd.}$	Jena glass. $T_{16'''} - T_{Hyd.}$
0	+0·000	+0·000	+0·000
10	+0·000	+0·052	+0·056
20	+0·000	+0·085	+0·093
30	−0·005	+0·102	+0·113
40	−0·010	+0·107	+0·120
50	−0·010	+0·103	+0·116
60	−0·010	+0·090	+0·103
70	−0·015	+0·072	+0·083
80	−0·020	+0·050	+0·058
90	−0·025	+0·026	+0·030
100	−0·000	+0·000	+0·000

observed in this investigation, the figures being rounded to the most probable 0°·005 C. For comparison purposes the figures for French "Verre Dur" and for "Jena Glass 16'''" are added in parallel columns, it being understood that each glass is treated in the manner prescribed for it, the Kew glass being a "fixed zero" scale and the other two "movable zero."

PARIS.

Academy of Sciences, September 10.—M. A. Chauveau in the chair.—Variations in the gravitation constant in the Simplon Tunnel: Marcel **Brillouin.** A *résumé* of the various corrections required by the crude readings of the instrument used. The complete work will be published in the *Recueil des Savants étrangers*.—The experiments of M. Villard and his theory of the aurora borealis: Carl **Störmer.** In his memoir published in 1904 on the motion of a material point carrying a charge of electricity, and continued in two recent notes in the *Comptes rendus*, the author has developed a theory which not only explains the phenomena experimentally observed by M. Villard, but also predicts others not yet observed, and renders doubtful certain of M. Villard's conclusions regarding the aurora borealis. The experiment of M. Villard, in which the magnetic field is due to two equal and opposite magnetic poles, is considered in detail in the present note, and the trajectories worked out for several cases, diagrams being given. The author draws the conclusion that Birkeland's theory is not shaken by M. Villard's paper.—The atomic weight of silver: P. A. **Guye** and G. **Ter-Gazarain.** Reasons are given for showing that the atomic weight of silver should be lowered from 107·93 to 107·89.—A case of formation of anthocyanine under the influence of the puncture of an insect (*Eurrhipara urticata*): Marcel **Mirande.**

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